

Appl. No. 09/271,011

Amdt Dated 10/24/2003

Reply to Office Action of 07/31/2003

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1 1. (Currently Amended) A method for preserving frame order across an aggregated
2 link comprised of a plurality of virtual links each supporting a particular transmission rate, the
3 method comprising:
4 receiving ~~up to~~ a plurality of indications denoting commencement of frame transmission
5 on each of the virtual links; and
6 assigning a plurality of pointer values to a corresponding plurality of records in a pointer
7 value buffer associated with each of the virtual links, the assignment of the plurality of pointer
8 values based, at least in part, on ~~a the~~ relative order in which data frames are transmitted on each
9 of the virtual links and each of the plurality of pointer values being used to determine an order
10 according to complete reception of the frame in which the data frames corresponding to the
11 plurality of pointer values are promoted from a receive buffer for transmission.

1 2. (Previously Amended) The method of claim 1, wherein prior to assigning the
2 plurality of pointer values, the method further comprising:
3 receiving the data frames transmitted on each of the plurality of virtual links in the
4 receive buffer.

1 3. (Previously Amended) The method of claim 2, further comprising:
2 reading the received data frames from the receive buffer based, at least in part, on the
3 pointer value assigned in each of the pointer value buffers.

Appl. No. 09/271,011
Amdt Dated 10/24/2003
Reply to Office Action of 07/31/2003

1 4. (Previously Amended) The method of claim 3, wherein frames are promoted from
2 the receive buffer to a system state with priority given to pointer value order in higher
3 transmission rate pointer value buffers.

1 5. (Original) The method of claim 1, wherein a plurality of pointer value buffers are
2 used to store pointer values denoting the commencement of transmission of frames on a
3 corresponding plurality of virtual links supporting a particular transmission speed.

1 6. (Original) The method of claim 1, wherein received frames are promoted in
2 pointer value order with priority given pointer values stored in the pointer value buffers
3 associated with higher transmission rate virtual links.

1 7. (Original) The method of claim 1, wherein the indication is an analog indication.

1 8. (Original) The method of claim 7, wherein the data network is an Ethernet
2 network and the indication is a receive data valid (RX_DV) signal.

1 9. (Original) The method of claim 1, wherein the order of pointer values in each of
2 the pointer value buffers do not correspond to the order of frame transmission.

1 10. (Currently Amended) An apparatus comprising:
2 a receive buffer having a plurality of records in which to store received frames of data;
3 a plurality of pointer value buffers each associated with one of a plurality of virtual links
4 of an aggregated link, each of the virtual links supporting a distinct transmission speed; and

Appl. No. 09/271,011
Amdt Dated 10/24/2003
Reply to Office Action of 07/31/2003

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a network interface, coupled to the receive buffer and the pointer value buffers, to assign a plurality of pointer values in appropriate buffers, from among the plurality of pointer value buffers, in response to the commencement of transmission of frames on the associated virtual link, the assignment of pointer values based, at least in part, on a the relative order in which the frames are transmitted and each of the plurality of pointer values being used to determine an order according to complete reception of the frame in which the frames of data are promoted from the receive buffer for transmission from the apparatus.

1 11. (Previously Amended) The apparatus of claim 10, wherein frames transmitted
2 over each of the virtual links are stored in the receive buffer until retired by the apparatus.

1 12. (Original) The apparatus of claim 10, wherein the indication is an analog
2 indication.

1 13. (Original) The apparatus of claim 12, wherein the indication is an asserted
2 receive data valid signal.

1 14. (Original) The apparatus of claim 10, wherein the network interface retires the
2 received frames from the receive buffer to a system state in order of pointer value in each of the
3 plurality of pointer value buffers.

1 15. (Original) The apparatus of claim 14, wherein the frames are retired in pointer
2 value order for each of the plurality of pointer value buffers, with priority given to pointer value
3 buffers associated with higher transmission rate virtual links.

Appl. No. 09/271,011
Amdt Dated 10/24/2003
Reply to Office Action of 07/31/2003

1 16. (Currently Amended) In a data network, a method for preserving frame order of a
2 plurality of frames transmitted across a plurality of virtual links of a multi-link trunk, wherein
3 each of the virtual links is associated with a discrete transmission rate, the method comprising:
4 receiving up to a plurality of indications denoting commencement of frame transmission
5 on each of the virtual links of the multi-link trunk; and
6 assigning a plurality of pointer values to a plurality of records in appropriate buffers, the
7 plurality of records corresponding to a number of indications received from each of the virtual
8 links, the appropriate buffers chosen from among a plurality of pointer value buffers associated
9 with the plurality of virtual links, the assignment of the plurality of pointer values based at least
10 in part on a relative order in which the indications of commencement of frame transmissions are
11 received and each of the plurality of pointer values being used to determine an order according to
12 complete reception of the frame in which frames corresponding to the plurality of pointer values
13 are promoted from a receive buffer for transmission.

1 17. (Original) The method of claim 16, further comprising promoting the received
2 frames from a common receive buffer in pointer value order of the pointer value buffers, with
3 priority given to the pointer value buffers associated with the higher transmission rate virtual
4 links.

1 18. (Original) The method of claim 16, wherein the indications are an analog signal
2 denoting receive data valid.

1 19. (Currently Amended) A storage medium comprising a plurality of executable
2 instructions which, when executed by a processor, cause the processor to implement a plurality

Appl. No. 09/271,011
Amdt Dated 10/24/2003
Reply to Office Action of 07/31/2003

3 of functions including a function to preserve frame order of frames transmitted over a plurality of
4 virtual links each associated with a discrete transmission rate, the function implementing pointer
5 value buffers associated with each of the virtual links and, upon receiving an indication of frame
6 transmission from the virtual link, stores pointer values in appropriate buffers from among the
7 pointer value buffers, the pointer values denoting the relative order of commencement of frame
8 transmission on the virtual link and each of the pointer values being used to determine an order
9 according to complete reception of the frame in which the frames corresponding to the pointer
10 values are promoted for transmission.

1 20. (Original) The storage medium of claim 19, wherein the executable instructions
2 further include instructions to promote data frames received in a common buffer from the
3 plurality of virtual links in pointer value order as stored in the pointer value buffers, with priority
4 given to pointer values stored in pointer value buffers associated with higher transmission rates.